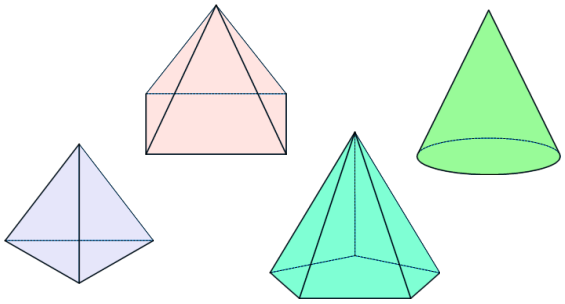
# Pyramids and Cones

12-5
12-6
13-2



Pyramids
lateral faces--triangles

altitude-height

slant height ($\ell$) height of lateral face

regular pyramid
- base regular polygon
- lateral edges congruent
- lateral faces congruent isosceles triangles
- altitude goes to the center of base

$LA = \frac{1}{2} p l$

$TA = LA + B$

$V = \frac{1}{3}Bh$

r = 5cm
$l$ = 13cm

$13^2 = 5^2 + h^2$
$144 = h^2$

h = 12cm

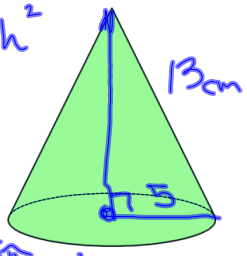
C = $10\pi$ cm

B = $25\pi$ cm$^2$

LA = $\frac{1}{2}pl$ $\frac{1}{2} \cdot 10\pi \cdot 13 = 65\pi$ cm$^2$

TA = $65\pi + 25\pi = 90\pi$ cm$^2$

V = $\frac{1}{3}Bh = \frac{1}{3} 25\pi \cdot 12 = 100\pi$ cm$^3$



Square pyramid

side is 6cm
lateral edge is 5cm

$h^2 + 3^2 = 4^2$
$h^2 = 7$
$h = \sqrt{7}$

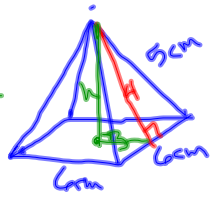
p = 24cm

B = $36cm^2$

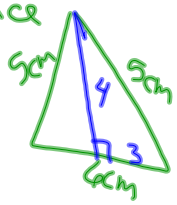
LA = $\frac{1}{2} \cdot 24 \cdot 4 = 48cm^2$

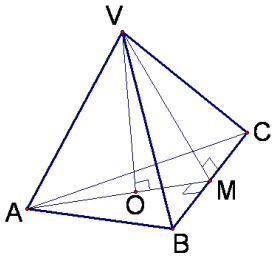
TA = $48 + 36 = 84cm^2$

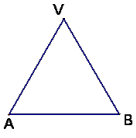
V = $\frac{1}{3} \cdot 36 \cdot \sqrt{7} = 12\sqrt{7}\ cm^3$

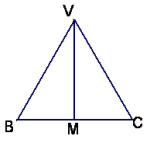


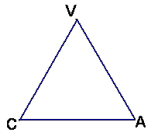

Draw lateral face

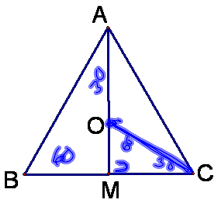


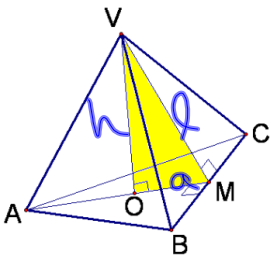



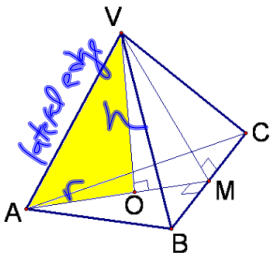



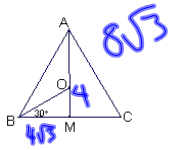



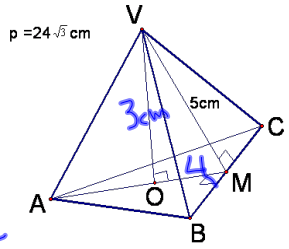






$8\sqrt{3}$

$4\sqrt{3}$




$B = 48\sqrt{3}\ cm^2$ $\frac{(8\sqrt{3})^2\sqrt{3}}{4}$

$a = 4\ cm$

$h = 3cm$

$LA = \frac{1}{2}24\sqrt{3} \cdot 5 = 60\sqrt{3}\ cm^2$

$TA = 108\sqrt{3}\ cm^2$

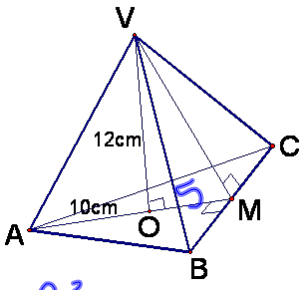
$V = \frac{1}{3}48\sqrt{3} \cdot 3$

$= 48\sqrt{3}\ cm^3$


$5\sqrt{3}$

$10\sqrt{3}$

$a = 5cm$




$l = 13\ cm$ $5^2 + 12^2 = l^2$

Oblique pyramids and cones use the same volume formula!

HW

| | |
|---|---|
| p663-664 | 7-9, 14, 21-23 |
| p668-669 | 11-13, 19 |
| p699 | 9, 11, 12, 15 |